

SIP based Communications in Netcentric Operations

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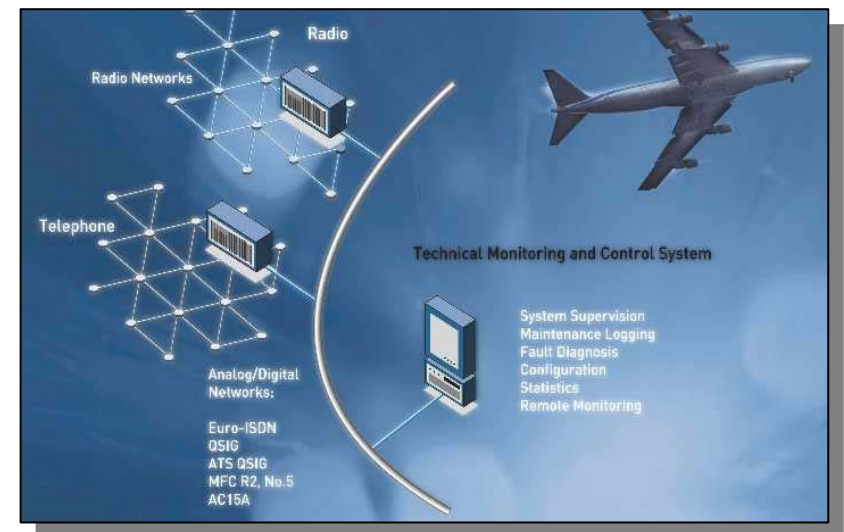
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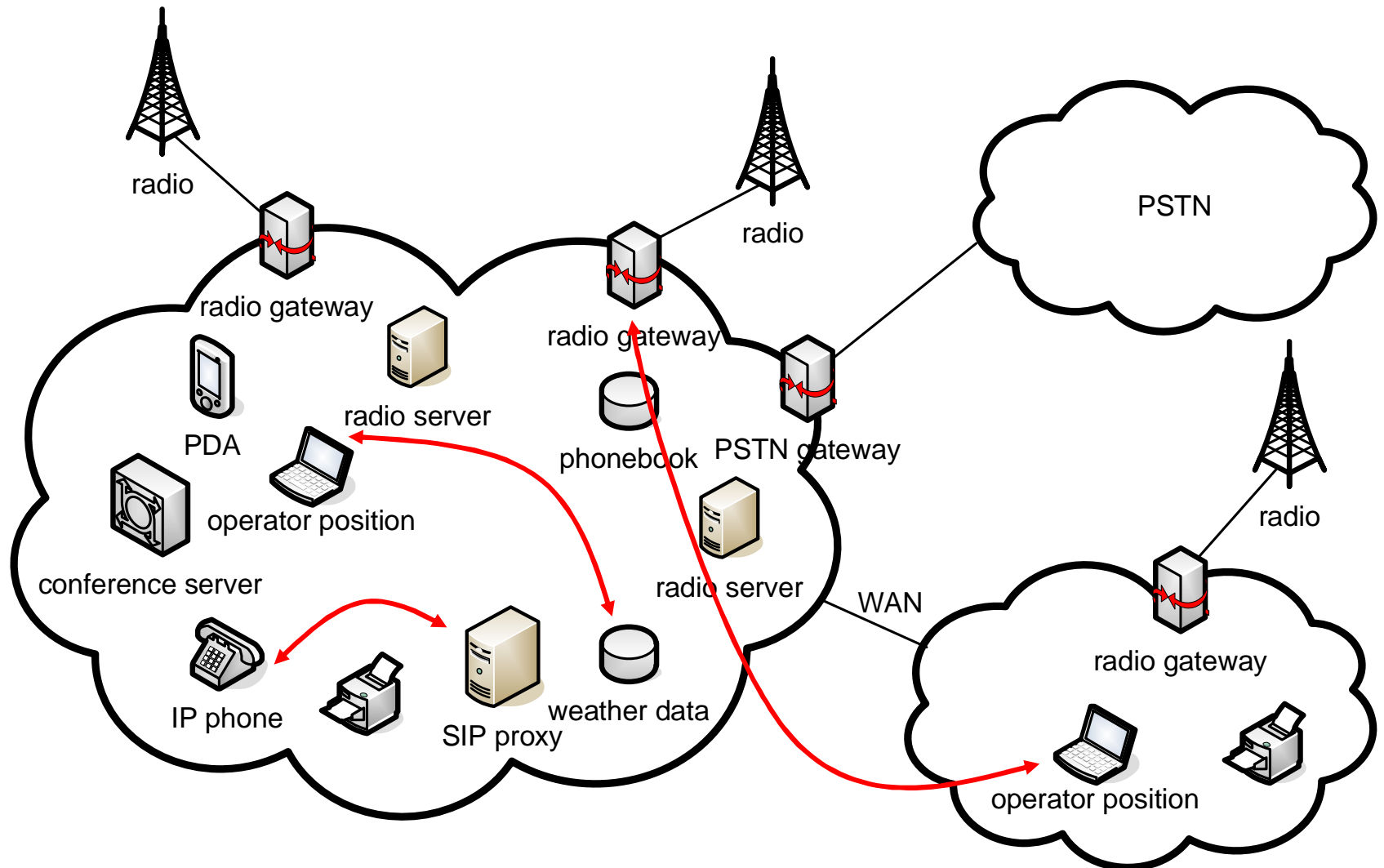
Content

- Basic Idea on Networked Operations
 - Concepts, Benefits
- Potential of IP based Communications
 - Service Location
 - SIP, VoIP





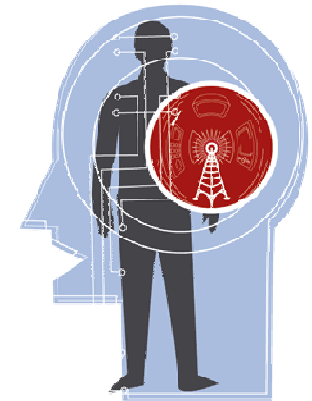
Netcentric Operations





Benefits

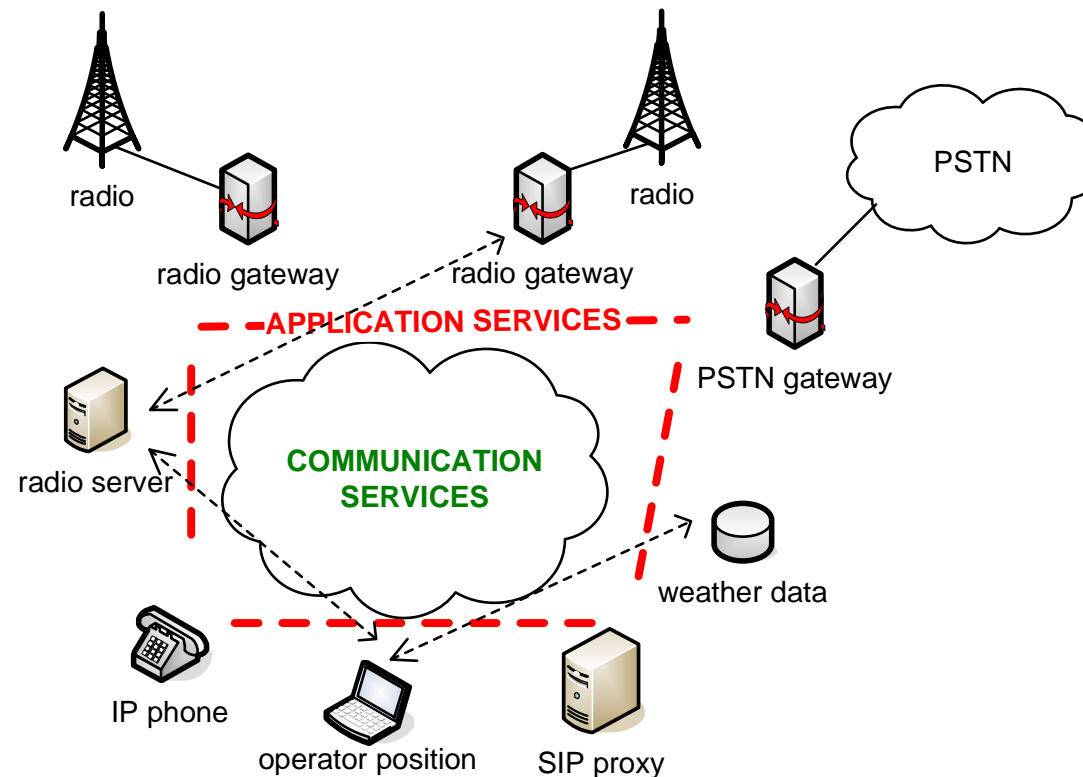
- **Increased Safety**
 - large infrastructure is set up of smaller units
 - smaller units less complex and more easy to manage
- **Increased flexibility in operations**
 - dynamic airspace restructuring
- **Increased operational capacity**
- **Incremental commissioning**
 - no single shot switch-on
 - transition concepts
- **Inherent Contingency**
 - the workload of a failing unit can be transferred





Basic Steps

- Separate **Communication Services** from **Application Services**
- Introduce standardized **Service Interfaces**





Service Location Protocol

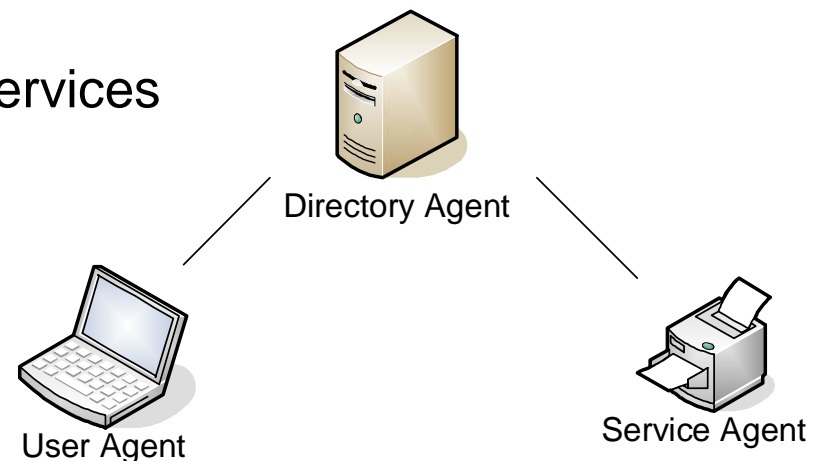
- Open standard (IETF RFC 2608)
- **Independent** of platform and programming language
- Highly **scalable**
- Supports both service **discovery and monitoring**
- Requires IP (uses mostly UDP)
- Scopes for administrative grouping
- **String-based** messages

- -> SLP fits **best with SIP**-based environment



Service Discovery

- Self-Configuration
 - obtain IP-address and SIP-address e.g. via DHCP (Dynamic Host Configuration Protocol)
- Service Discovery (= Service Location)
 - discover available services automatically
 - browse for specific services
 - directory-based or directory-less
- Monitoring
 - detect new and disappearing services
 - detect failures





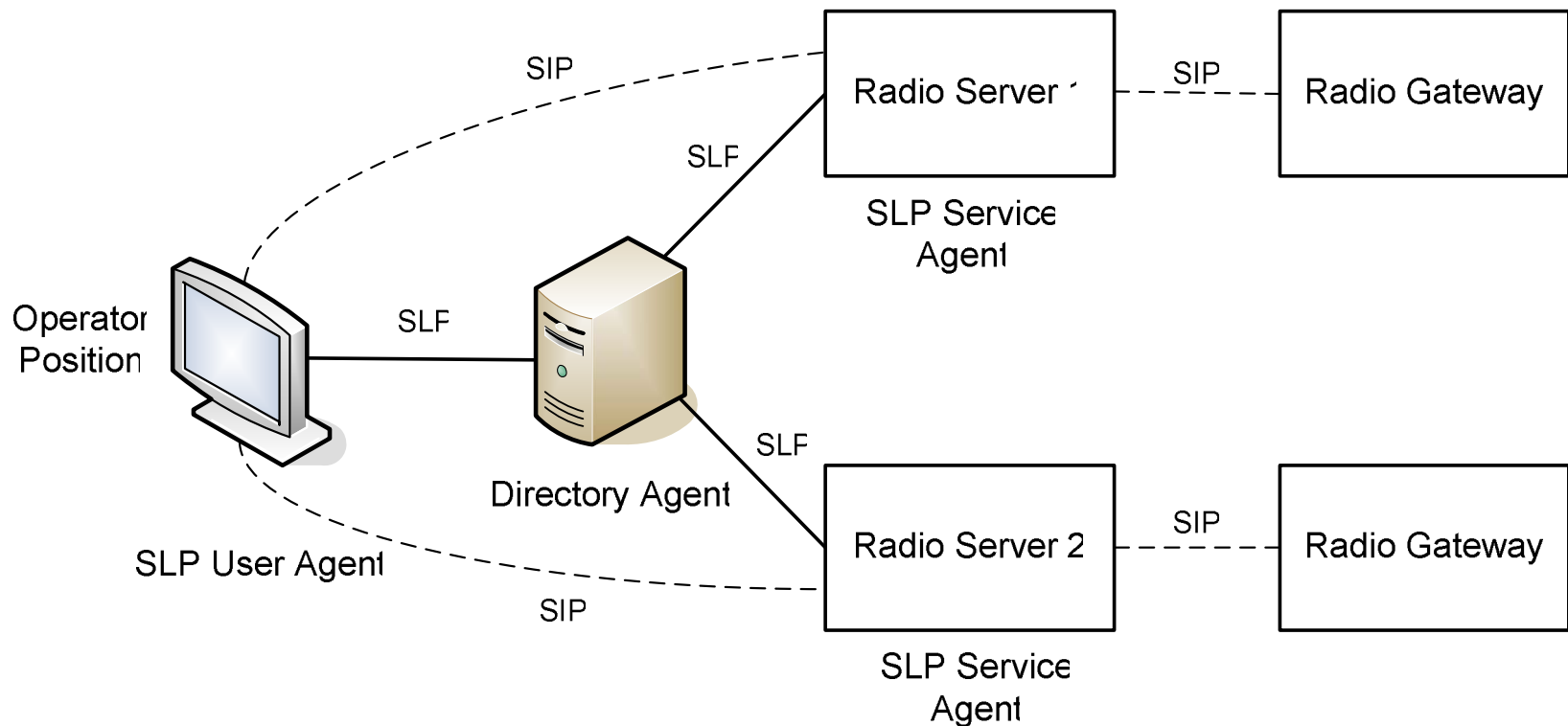
Monitoring Principles

- Polling
 - simple but inefficient
 - increases **network traffic** or too lazy
- Registration refreshment (directory-based mode)
 - registration is **valid for a certain time**
 - re-registration necessary
 - registration times out in case of failure
- Eventing
 - subscribe for interesting events
 - **notification when event** occurs



Implementation Example

- Integrated into existing SIP-based environment
 - directory based service architecture
 - eventing enabled





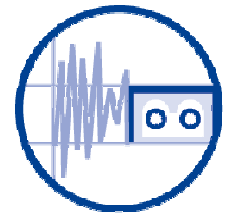
VoIP Issues

■ Application Services

- SIP and SLP protocol provide very powerful mechanisms for Service Interfaces and Service Discovery that take packet based networking paradigms into account
- SIP allows to incorporate radio specific controls

■ Communication Services

- the transfer of IP packets through a network does not add to the delays significantly
 - jitter compensation
- delays are introduced by the end system
 - **systematic**: duration of voice that needs to go into a packet
 - protocol processing delay of general purpose computers





VoIP Application Scenarios

- **Mobile and Dispatched Missions**
 - units are on demand dispatched into mission areas and set up the service with available resources
 - applies to Defense and Public Safety Organizations
- **Networked Operations between fixed facilities**
 - interconnection via IP-based WAN
- **Re-use existing IP infrastructure within facilities**
 - put voice applications on the existing IP network





VoIP Enables Networked Operations

Thank you for your attention!

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